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EXAMINER

FASTOVSKY, LEONID M

ART UNIT PAPER NUMBER

3742

DATE MAILED: 01/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/727,025

Applicant(s)

QI ET AL.

Examiner

Leonid M Fastovsky

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 October 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-40 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-12 and 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. The claims are generally narrative and indefinite, failing to conform with current U.S. practice. They appear to be a literal translation into English from a foreign document and are replete with grammatical and idiomatic errors.

4. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite in that it fails to point out what is included or excluded by the claim language. This claim is an omnibus type claim. In line 3, Applicant cites the word "and" and in line 4, he cites the word "or".

In claim 4, the phrase "...polyaniline fiber comprises..." in line 2, is indefinite because in claim 1 Applicant cites the phrase "... consisting of conductive polyaniline fiber ..." in line 2.

5. Claim 20 recites the limitation "the heating apparatus" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1-2 are rejected under 35 U.S.C. 102(e) as being anticipated by Rock et al (2004/0045955).

Rock teaches a heating apparatus comprising a heating element 16 and a battery pack 36 for passing a voltage and current through the heating element, and the heating element selected from a conductive textile that includes conductive fibers and/or yarns that include polyaniline (page 4 [0042]).

8. Claims 13-18 are rejected under 35 U.S.C. 102(e) as being anticipated by Mattes et al (2004/0119187).

The applied reference has a common assignee and inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention “by another,” or by an appropriate showing under 37 CFR 1.131.

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Mattes teaches a conductive polyaniline fiber comprising at least one dopant and characterized by an-spun conductivity of $> 100 \text{ S/cm}$, an spun peak stress $> 75 \text{ Mpa}$, and an inherently chosen diameter and a as-spun modulus $> 1 \text{ Gpa}$, and as-spun percent extension at fracture > 10 (page 14, Table 15).

As for claims 15 –18, Mattes teaches a sulfonic acid and a molecular weight of $> 200,00 \text{ g/mol}$ (page 16 [0145]).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kitagaki et al (4,792,662) in view of Hsu et al (5,882,566).

Kitagaki teaches an electrical heating element 1 comprising an electrically conductive yarns 5 and non-conductive yarns 6 (Fig. 2), and yarns 2 and 3 in the form of fabric, but does not teach a polyaniline yarn. Hsu teaches an electrically conductive polyaniline yarn (col. 11, lines 50-63). It would have been obvious to one having ordinary skill in the art to modify Kitagaki's invention to replace its yarn 5 with polyaniline yarn of Hsu in order to make a heating apparatus with high strength and consistent conductivity by Hsu's teaching (col. 1, lines 45-54). As for means for passing a voltage or current through the heating element, it would be obvious to connect this electrical sheet to a

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power source in order to provide heat as a common knowledge. By the way, Applicant has not provided any details for these means in his application.

11. Claims 3, 8-10 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kitagaki in view of Hsu and further in view of Lee et al (2004/0162397) and in view of Fukushima et al (5,656,709).

Kitagaki in view of Hsu teaches substantially the claimed invention including a doped polyaniline having a chosen diameter cited by Hsu (col. 11, lines 50-62), but does not teach ranges of conductivity, peak stress and as-spun module. Lee teaches an electrically conductive polymer with conductivity in excess of 103S/cm (Abstract), and Fukushima teaches a hybrid material comprising of polyaniline (col. 19, line 63), and having a peak stress of 110 MPa and as-spun modulus of 2.3 (Col. 25, Table 2). It would have been obvious to one having ordinary skill in the art to modify the invention of Kitagaki in view of Hsu to include ranges of conductivity, peak stress and as-spun module as taught by Lee and Fukushima in order to improve durability of the polyaniline heater.

12. Claims 4-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kitagaki in view of Hsu and further in view of Pron et al (2003/0091845).

Kitagaki in view of Hsu teaches substantially the claimed invention, but does not teach a deterioration of conductivity of polyaniline at certain temperatures. Pron teaches variations of reduced conductivity of polyaniline at different temperatures (page 6, [100] [101]). It would have been obvious to one having ordinary skill in the art to modify the

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invention of Kitagaki in view of Hsu as taught by Pron in order to maintain conductivity of the heating apparatus when conductivity of the conductive polyaniline is reduced.

13. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kitagaki in view of Hsu and further in view of Barry, Jr. (5,176,851).

Kitagaki in view of Hsu teaches substantially the claimed invention, but does not teach redoping of polyaniline fiber. Barry teaches a method of enhancing polyaniline conductivity including doping and redoping (col. Col. 5-8). It would have been obvious to one having ordinary skill in the art to modify the invention of Kitagaki in view of Hsu to include redoping of polyaniline fiber as taught by Barry in order to positively effect electrical and mechanical properties of the heating apparatus.

14. Claims 13 -15 and 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hsu in view of Lee et al and further in view of Fukushima.

Hsu teaches substantially the claimed invention including a doped polyaniline having a chosen diameter (col. 11, lines 50-62), but does not teach ranges of conductivity, peak stress and as-spun module. Lee teaches an electrically conductive polymer with conductivity in excess of 103S/cm (Abstract), and Fukushima teaches a hybrid material comprising of polyaniline (col. 19, line 63), and having a peak stress of 110 MPa and as-spun modulus of 2.3 (Col. 25, Table 2). It would have been obvious to one having ordinary skill in the art to modify the invention Hsu to include ranges of conductivity, peak stress and as-spun module as taught by Lee and Fukushima in order to improve durability of the polyaniline heater.

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As for claims 15 and 17-20, Hsu teaches that the polyaniline fiber is generated from sulfonic acid groups (col. 6, lines 38-54, Table 1)

15. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hsu and further in view of Eiffler (5,188,766).

Hsu teaches substantially the claimed invention including sulfonic acid and molecular weight (col. 2, lines 58-67), but does not teach a range of the molecular weight. Eiffler teaches a polymer having a molecular weight more than 200,000 g/mol (col. 9, lines 26-30). It would have been obvious to one having ordinary skill in the art to modify the invention of Hsu to include a range of molecular weight in polyaniline fiber of Hsu in order to make the polyaniline fiber about a generally average weight (col. 9, lines 26-30).

16. Claims 21-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hsu in view of Pron.

Hsu teaches substantially the claimed invention, but does not teach a deterioration of conductivity of polyaniline at certain temperatures. Pron teaches variations of reduced conductivity of polyaniline at different temperatures (page 6, [100] [101]). It would have been obvious to one having ordinary skill in the art to modify the invention of Hsu as taught by Pron in order to maintain conductivity of the heating apparatus when conductivity of the conductive polyaniline is reduced.

17. Claims 27-29, 31-33 and 39-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kitagaki in view of Hsu and further in view of Lee and Fukushima.

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Kitagaki in view of Hsu teaches substantially the claimed invention including a doped polyaniline having a chosen diameter cited by Hsu (col. 11, lines 50-62), but does not teach ranges of conductivity, peak stress and as-spun module. Lee teaches an electrically conductive polymer with conductivity in excess of 103S/cm (Abstract), and Fukushima teaches a hybrid material comprising of polyaniline (col. 19, line 63), and having a peak stress of 110 MPa and as-spun modulus of 2.3 (Col. 25, Table 2). It would have been obvious to one having ordinary skill in the art to modify the invention of Kitagaki in view of Hsu to include ranges of conductivity, peak stress and as-spun module as taught by Lee and Fukushima in order to improve durability of the polyaniline heater.

As for claims 29 and 31-33, Hsu teaches that the polyaniline fiber is generated from sulfonic acid groups (col. 6, lines 38-54, Table 1).

18. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kitagaki in view of Hsu, Lee and Fukushima and further in view of Eiffler.

Kitagaki in view of Hsu, Lee and Fukushima teaches substantially the claimed invention including sulfonic acid and molecular weight (col. 2, lines 58-67), but does not teach a range of the molecular weight. Eiffler teaches a polymer having a molecular weight more than 200,000 g/mol (col. 9, lines 26-30). It would have been obvious to one having ordinary skill in the art to modify the invention of Kitagaki in view of Hsu, Lee and Fukushima to include a range of molecular weight in polyaniline fiber of Hsu in order to make the polyaniline fiber about a generally average weight (col. 9, lines 26-30).

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19. Claims 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kitagaki in view of Hsu, Lee and Fukushima and further in view of Barry.

Kitagaki in view of Hsu teaches substantially the claimed invention, but does not teach redoping of polyaniline fiber. Barry teaches a method of enhancing polyaniline conductivity including doping and redoping (col. Col. 5-8). It would have been obvious to one having ordinary skill in the art to modify the invention of Kitagaki in view of Hsu to include redoping of polyaniline fiber as taught by Barry in order to positively effect electrical and mechanical properties of the heating apparatus.

20. Claims 35-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kitagaki in view of Hsu, Lee and Fukushima and further in view of Pron.

Hsu teaches substantially the claimed invention, but does not teach a deterioration of conductivity of polyaniline at certain temperatures. Pron teaches variations of reduced conductivity of polyaniline at different temperatures (page 6, [100] [101]). It would have been obvious to one having ordinary skill in the art to modify the invention of Hsu as taught by Pron in order to maintain conductivity of the heating apparatus when conductivity of the conductive polyaniline is reduced.

19. Claims 11-12,17-18, 20, 32, 34 and 40 are product by process claims.

Response to Arguments


20. Applicant's arguments with respect to claims 1-40 have been considered but are moot in view of the new ground(s) of rejection.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leonid M Fastovsky whose telephone number is 571-272-4778. The examiner can normally be reached on M-Th. 8.00 am -6.00 pm.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robin Evans can be reached on 571-272-4777. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Leonid M Fastovsky
Examiner
Art Unit 3742

1/6/05

lmf


ROBIN O. EVANS
PRIMARY EXAMINER
1/6/05